

A new vision upon the classification of etiologic factors of premature birth

³ Oancea A., ^{1,2} Anastasiu Popov Diana Maria, Anastasiu D., ³ Stănescu Casiana, ² Gluhovschi A.

¹ Victor Babeş University of Medicine and Pharmacy Timisoara

² Department of Obstetrics and Gynecology XII Bega Timisoara

³ West University „ Vasile Goldis' Arad
 Department of General Medicine

ABSTRACT. Premature birth remains at present a matter of obstetrics due to immediate and delayed complications which may occur in premature newborns. Premature birth causes 90-95% of perinatal mortality in maternities. In Arad county it fluctuates between 10-13%. Preterm labor etiology is multifactorial, about 25% of cases remaining unknown. The aim is to achieve an extension of the gestational age on threats of premature birth by studying these etiological factors and their frequency on triggering preterm labor. To study the etiology of preterm delivery in Arad we plan to make a new classification of etiological factors that facilitate inclusion and appreciation of their role in the etiology of preterm labor. Our proposed classification in avoidable and unavoidable factors also highlights how we can intervene with sanogenic methods in removing avoidable factors and involvement of the pregnant woman in working with the obstetrician to achieve this objective. By studying the frequency of etiologic factors and their involvement in triggering premature labor we can see and analyze the incidence of the most common etiologic factors involved in triggering premature labor in Arad.

KEYWORDS: prematurity, birth, etiology

INTRODUCTION

In 1950 the World Health Organization defined prematurity as any birth resulting in a new born under 2500g. (2,15)

Ten years later in 1961, WHO introduced new criteria for the definition of prematurity respectively gestational age below 37 weeks, fetus length of 35-46 cm added to the old criterion of weight under 2500g. (2)

With progress in obstetrics and neonatology, WHO reduced gestational age to 24 weeks gestation and fetal minimum weight of 500g, the fetus showing signs of fetal viability at birth.

Prematurity is today a social problem and one of public health due to the fact that 80% of mortality in infants is given by prematurity on which we can add immediate and late sechelarity, 50% of prematures remain with neurological long-term diseases, representing 45% cases of cerebral paralysis, 35% of cases of visual disturbances and 25% of cases with hearing problems on which we can add:

- motor deficit disorders (minor or major), adaptability, behavioral, psychological disturbances and mental retardation. (6,10,12)

Complications of prematurity in the long term are: lung dysplasia, asthma, recurrent respiratory infections, gastro-oesophageal reflux and increased risk of sudden death of the newborn. (15:16)

Immediate complications of prematurity are:

- Hypothermia
- Hypo- or hyperglycaemia
- Respiratory complications:
- Respiratory distress syndrome even to cezarian born babies (Sciara syndrome)
- Lung dysplasia
- Apnea of prematurity
- Cardiovascular Complications represented by:
 - Persistent arterial duct
 - Systemic hypotension
 - Interventricular hemorrhage
 - Ulceronecrotic enterocolitis
 - Systemic infection or neonatal sepsis

These complications of prematurity are not mandatory, great geniuses of mankind being born premature: Napoleon, Bach, Wagner, Beethoven, Picasso.

Preterm infant care costs are very high being inversely proportional to the degree of prematurity, preterm infant care Grade IV is much higher than that of a premature Grade I. Often such a premature remains sechelary leaving a burden to family and society .

For these reasons Minckovschi said that "premature birth should be considered a social disaster " and Benson and Babson ,, premature birth infanticide is escaping the law, killing many children and causes many infirmities'

The incidence of premature birth

The incidence of prematurity fluctuated over time by country, population, standard of living, level of medical culture. (1)

Developments in the US between 1990-2006 the incidence of prematurity was (2):

- 1990: 10,6%
- 2000: 11,6%
- 2005: 12,7%
- 2006: 12,8%

In Asia:

- India and Pakistan: 34,7%

The best indicators in Europe were recorded in the Nordic countries Sweden, Denmark, Norway: 3.76 to 4.45%.

Portugal: 12%

Developments in Romania's index of prematurity in the last 25 years ranged from 7.23 to 15%.

Timișoara: 7,3% Munteanu (3)

Arad: 7,23% Anastasiu (3)

Sibiu: 7,6% Vintilă (4)

Bacău: 10,1% Burlacu (3)

București: 7,5% Nicolau (6)

Arad (2015): 9,29% Furău

In 2005 there was an increase in the index of prematurity in Romania between 15-19%, today the national average is fluctuating between 10-12%.

Etiology of preterm recognizes the following classic categories: maternal factors, ovulation factors, fetal factors, traumatic factors, chronic poisoning (lead, mercury, etc.) and parental factors. (5)

Through observational and comparative studies in the last 40 years on the etiology of preterm labor we proceeded to make a new classification of these etiologic factors as follows:

I. Factors that can be influenced and factors that cannot be influenced:

1.Factors related to a woman's biological constitution:

These are factors that can not be influenced and are:

- Minor under 18 years of age
- Primiparous under 20 years
- Primiparous over 35 years
- Rh negative (with Rh positive husband)
- Height under 155 cm

- Weight below 45 kg when taken into evidence
- Genital congenital malformations
- ABO group incompatibility with present antibodies A and B.

2. Obstetrical and gynecological history of the woman:

This is the second category of factors that cannot be influenced:

- Post caesarean operation scared uterus or after miomectomy or correction operation of congenital malformations type operation Strassman – uterine curettage in history for the interruption during pregnancy
- Premature birth in history or spontaneous abortions in the second trimester of pregnancy
- Abortifacient disease (more than 3 miscarriages)
- High parity (multiparity)
- Cervico-ismic failure
- Col scar (after conization, cervical tears at past births)
- Mullerian abnormality
- Incorect timing of births (short interval between premature births)
- Genetic factor - the theory of fetal atavism

In our classification the following are a category of premature birth etiological factors that can be influenced by prenatal consultation, interdisciplinary consultations and social protection measures through the legislation for the protection of the pregnant woman.

3.Socio-economic factors. These are factors related to socio-economic conditions of the family in which the pregnant comes from and conditions at the workplace:

- Tiring work
- Prolonged standing
- Long daily commute or travel
- Home above the 3rd floor without an elevator
- Unwanted pregnancy
- Unmarried pregnant woman
- Domestic violence
- Stress / depression: negative events
- Smoking, drinking or drugs
- Excessive weight gain in pregnancy
- Low socioeconomic status
- Malnutrition (hypovitaminosis) - so called "poor pregnant " which Delcroix calls it a pre-condition of the pregnant woman with high obstetrical risk.

4.Factors related to the ongoing pregnancy - are a category of factors that some can be influenced and others cannot. They are the following:

- Multiple pregnancy increasing due to assisted human reproduction procedures.

- Pregnancy after IVF (in vitro fertilization)
- Placenta praevia
- Bleeding in the second trimester of pregnancy
- Premature departure from normal inserted placenta DPPNI
- Uteroplacental apoplexy
- Cervical infections - Vaginal
- Uterus shrink
- Excessive weight increase during pregnancy
- Pregnancy-induced hypertension (BP > 140/80)
- Proteinuria (> 3g)
- Pelvic presentation at 7 months

5. Pathology associated with pregnancy is represented by all general conditions existing or arising during pregnancy and that can be a determinant of premature births. This category is represented by:

- Heart disease Class I, II, III, IV
- Respiratory diseases: pneumopathies, chronic obstructive bronhopaties
- Endocrine diseases (diabetes, hypothyroidism)
- Infectious diseases: tuberculosis, rubella, varicella
- Parasitic disease: toxoplasmosis, listeriosis, brucellosis, toxoplasmosis being the most associated to abortive fetopaties
- Mental illness: mental retardation, schizophrenia, mental retardation.
- Renal diseases: glomerulonephritis, pyelonephritis, urinary tract infection (E. coli, Proteus, asimptompatic bacteriuria)
- Acute and chronic poisoning (lead, mercury, selenium)
- Reproductive tumors (uterine fibroids, ovarian cyst, genital cancers)

In assessing the factors, we took into account the rate of premature birth risk presented by Papiernic-Berhauer at the Perinatal seminar in 1969 at Tours, and the changes made by Creasy and Liggins in 1979.

We must not omit the fetal atavism theory (Coja 1989) which considers that premature birth is due to a record in the genetic code of a fetus of 32-34 weeks gestation, it is not excluded that a human ancestor was born normal at 7 months, thus many premature births can evolve as a normal term birth and we can not detect anything pathological.

CONCLUSION:

1. Premature births have a multiple etiology, 25% of the etiology is not known.
2. The new classification proposed by us permits a didactical and practical sistematisation in the study on the etiology of premature births.
3. Clasification of the factors into those that can be influenced and those that cannot be influenced allows for a easier identification

and selection of the factors that can be influenced raising in this way the possibility of maintain the pregnancy up to at least 37 weeks of gestation.

4. Favorable results in the fight against prematurity require combining medical and biological methods with socio-economic methods.
5. In contemporaneousness we must accept a 2% premature ireductability.

BIBLIOGRAPHY:

- 1 Berkowitz G. , Papiernik E. – Epidemiology of pretern birth. *Epidemiology rev.* 1993, 15, pag 414-443
- 2 Sayres WG – Pretern labor. *Dm. Fam. Physician.* 2010 81(4) pag 477-487
- 3 Anastasiu D. , Bunescu S. , Ruczi. , Chioreanu L. – Unele aspecte privind incidența și rezolvarea nașterii premature în perioada 1974-1988. , vol. al X-lea Comp. Mat. Obst. Ginec. Brașov 1989, pag 179
- 4 Anastasiu D. , Cameniță T. , Crișan I. , Ruczi – Considerații asupra nașterii premature prin operația cezariană în perioada 1974-1978, vol. al X-lea Comp. Mat. Obst. Ginec. Brașov 1989 pag. 178
- 5 Cernea Maria – Cauzele prematurității – vol al X-lea Comp. Mat. Obst. Ginec. Brașov 1989, pag 27-33
- 6 Nicolau S. , Teodoru G C. , Nicolescu S, M. Suciu, Dana Giurgitiu – Prematuritatea – problemă de sănătate publică, vol. al X-lea Comp. Mat. Obst. Ginec., Brașov, 1989, pag. 9-13
- 7 Cnatingius S, Villamor E, Johansson S, et al: Maternal obesity and risk of pretern delivery. *JAMMA* 2013, 309(22) pag. 2362-2370
- 8 Borg, F., Gravino, G., Schembri-Wismayer, P., & CallejaAgius, J. (2013). Prediction of preterm birth. *Minerva Ginecologica*, 65(3), 345–360
- 9 Berkowitz GS(1), Blackmore-Prince C, Lapinski RH – Risk factors for pretern birth subtypes, *Epidemiology* 1998, 9(3) , pag. 279-285
- 10 Bărsan C, Crișan I – Implicația prematurității în incidenta copilului handicapat motor. Vol al X-lea Comp. Mat. Obst. Ginecologie, Brașov 1989, pag.209-218
11. I. Munteanu – *Trat. De obstetrică vol. I, Ed. Acad. Rom. Buc. Ed II-a* 2006
- 12 E. Bernad, B. Richards, G.I Mihalas – *Mortalitatea perinatală în I. Munteanu : Tratat de obstetrică, Ed.Acad. Rom. Buc. 2006, Editia II, pag.1525-1534*
- 13 I Munteanu, D. Anastasiu, R Munteanu – *Consultația prenatală în depistarea și dispensarizarea sarcini cu risc crescut, Tratat de Obst. Ed. II-a Edit. Acad. Rom. Buc. 2006, pag 1480-1489*

14 F. Pricop, ST. Butureanu. Nașterea prematură în I. Munteanu, *Tratat de Obst. Vol I, Ed. II-a Buc. Ed. Acad. Rom. pag. 497-510*

15 Ioanid I, Mihăilescu A, Butureanu ST – Prematuritatea – aspecte etiopatogenice și profilactice . vol. al X-lea Congres Nat. Obst. Ginecologie Brașov 1989, pag 125